

CLAIMS:

1. An apparatus for use with a high strength magnet in detecting a ferromagnetic object approaching the magnet, the apparatus comprising:

guide members defining a path along which persons, who are approaching the magnet and potentially transporting a ferromagnetic object, are prescribed to pass;

said guide members being arranged such that said path is located, in use, in the magnetic field of the magnet;

at least one sense coil mounted at the guide members and arranged at a predetermined location and orientation relative to the guide members such that, as a person transporting a ferromagnetic object to be detected passes along the prescribed path, the movement of the ferromagnetic object in the field of the magnet causes a voltage to be generated in the at least one sense coil;

and an electrical measuring device for measuring an electrical signal generated by the sense coil when the ferromagnetic object travels in the path, the electrical measuring device being arranged to provide a warning indication when the electrical signal exceeds a predetermined value.

2. The apparatus according to Claim 1 wherein path and field are substantially parallel.

3. The apparatus according to Claim 1 or 2 wherein the at least one coil provides substantially vertical coil legs at spaced positions along the path.

4. The apparatus according to Claim 3 wherein the substantially vertical coil legs at spaced positions along the path have a height of the order of the height of a person walking along the path.
5. The apparatus according to any one of Claims 1 to 4 wherein the at least one coil lies in a plane generally parallel to the path along one side of the path.
6. The apparatus according to any one of Claims 1 to 5 wherein the at least one coil includes at least two coils arranged to provide on each side of the path two substantially vertical coil legs at spaced positions along the path.
7. The apparatus according to any one of Claims 1 to 6 wherein the at least one coil includes at least two coils, one on each side of path.
8. The apparatus according to any one of Claims 1 to 7 wherein the at least one coil includes at least one additional coil shaped and arranged to cancel components of electrical signal generated by fields or movements outside of the path.
9. The apparatus according to any one of Claims 1 to 8 wherein the at least one coil includes two sets of coils each set on a respective side of the path and each set having the coils thereof parallel to the path.
10. The apparatus according to Claim 9 wherein each set of coils includes an outermost largest coil, an intermediate coil smaller than the outermost coil, and two innermost coils which are each smaller than the intermediate coil and arranged one above the other.
11. The apparatus according to Claim 10 wherein each of the coils of the set provides substantially vertical coil legs at spaced positions along

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the path with interconnecting top and bottom coil portions lying in a common plane at the top and bottom of the path.

12. The apparatus according to any one of Claims 1 to 11 wherein at least one sense coil defines a zone within the at least one sense coil and there is provided a device for detecting entry of the person into and departure of the person from the zone.

13. The apparatus according to Claim 12 wherein the electrical measuring device is arranged to provide an integral of the electrical signal as the person moves through the zone.

14. The apparatus according to Claim 12 or 13 wherein the at least one coil includes two vertical coil legs at spaced positions along the path and the detecting device is arranged at the legs so as to define the zone therebetween.

15. The apparatus according to any one of Claims 1 to 14 wherein the at least one coil and the path are mounted on at least one anti-vibration platform.

16. A combination of a high strength magnet and an apparatus for use in detecting a ferromagnetic object approaching the magnet, the apparatus according to any one of Claims 1 to 15, wherein the apparatus is mounted in the fringe field of the magnet.